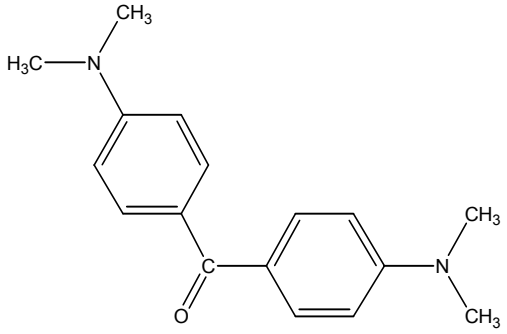
MICHLER'S KETONE (4,4′-(DIMETHYLAMINO)BENZOPHENONE)
CAS No. 90-94-8
First Listed in the *Third Annual Report on Carcinogens*



CARCINOGENICITY

Michler's ketone (4,4′-(dimethylamino)benzophenone) is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (NCI 181, 1979). When administered orally in the diet, Michler's ketone induced increased incidences of hepatocellular carcinomas in rats of both sexes and in female mice and hemangiosarcomas (primarily subcutaneous) in male mice. In view of an NCI/OTA correlative interpretation, these results can be considered to provide sufficient evidence for the carcinogenicity of Michler's ketone in experimental animals (Griesemer & Cueto, 1980; OTA, 1981).

There are no data available to evaluate the carcinogenicity of Michler's ketone in humans.

PROPERTIES

Michler's ketone is a blue powder or white to green-colored leaflets. It is practically insoluble in water and ether, but soluble in alcohol, pyrimidine, and warm benzene. When heated to decomposition, it emits toxic fumes of nitrogen oxides (NO_x). Michler's ketone is combustible.

USE

Michler's ketone, 4,4′-(dimethylamino)benzophenone, is a chemical intermediate used in the synthesis of at least 13 dyes and pigments, particularly auramine derivatives (NCI 181, 1979; Kirk-Othmer V.23, 1983). These pigments are used to dye paper, textiles, and leather, and one is used as an antiseptic fungicide (Sax, 1987).

PRODUCTION

The USITC does not currently identify any producers or production volumes of Michler's ketone. U.S. imports in 1983 totalled more than 24,000 lb (USITCa, 1984). In 1980, the United States imported 40,000 lb of Michler's ketone. One domestic producer manufactured such a

small quantity of the compound in 1980 that production data reports to the USITC were not required. The 1979 TSCA Inventory identified six companies producing 55,000 lb of Michler's ketone in 1977 and four companies importing 55,000 lb, with some site limitations. The CBI Aggregate was less than 1 million lb (TSCA, 1979). No data on exports were available.

EXPOSURE

The primary routes of potential human exposure to Michler's ketone are inhalation and dermal contact. The risk of potential occupational exposure is greatest for workers in facilities that manufacture the compound or any of the dyestuffs for which Michler's ketone is an intermediate. The National Occupational Exposure Survey (1981-1983) estimated that 1,976 total workers, including 403 women, potentially were exposed to Michler's ketone in the workplace (NIOSH, 1984). Residual levels of trace impurities of Michler's ketone may be present in some dyes based on the chemical and in the final consumer products. CPSC has stated that exposure even to trace amounts may be a cause for concern, based on experience with other dyes derived from aromatic amines. Data are inadequate to describe the actual levels of impurities in the final product and the potential for consumer exposure and uptake. The Toxic Chemical Release Inventory (EPA) listed four industrial facilities that produced, processed, or otherwise used Michler's ketone in 1988 (TRI, 1990). In compliance with the Community Right-to-know Program, the facilities reported releases of Michler's ketone to the environment which were estimated to total 1,100 lb.

REGULATIONS

EPA regulates Michler's ketone under the Resource Conservation and Recovery Act (RCRA) and the Superfund Amendments and Reauthorization Act (SARA). This compound is regulated as a hazardous constituent of waste under RCRA, and it is subject to report and recordkeeping requirements under RCRA and SARA. The low production volume of Michler's ketone is the reason that EPA has not attributed the compound a high regulatory priority. It may be considered further as the dyes and pigments industry is studied. OSHA regulates Michler's ketone under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-86.